Clear Creek Bridge
Spanning Clear Creek on Farm Road 33,
3.0 Miles North of Ash Grove, 3.5
Miles southwest of Walnut Grove
Ash Grove vicinity
Greene County
Missouri

HAER No. MO-41

HAER MO, 39-ASGRO.V,

## PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
Rocky Mountain Regional Office
National Park Service
U. S. Department of the Interior
P. O. Box 25287
Denver, Colorado 80225

#### HISTORIC AMERICAN ENGINEERING RECORD

# Clear Creek Bridge

HAER No. MO-41

HAER 39-ASGPD. V.

Location:

Spanning Clear Creek on Farm Road 33, 3.25 miles north and 3.5 miles southwest of Walnut Grove, Ash Grove vicinity, in northwestern Greene County, Missouri

UTM:

Northeastern end: 15.4135380N.448860E Southwestern end: 15.4135320N.448840E

Quad: Ash Grove

Date of Construction:

1895-1896; 1904 - superstructure floor and approach

spans replaced.

Builder:

Wrought Iron Bridge Company of Canton, Ohio

Present Owner:

Greene County

Greene County Courthouse Springfield. Missouri

Present Use:

Vehicular bridge, to be replaced by a new vehicular bridge. Projected date of removal is late summer 1988. Metal truss to be retained and made available for

reconstruction.

Significance:

Clear Creek Bridge is a single span steel and wrought iron Pratt through truss bridge. As such, it is one of four known extant 19th century examples in Greene

County.

Historian:

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Center for Archaeological Research Southwest Missouri State University

July 1988

### I. EXPANSION OF GREENE COUNTY TRANSPORTATION NETWORK

The construction of the Clear Creek Bridge is best understood within the context of economic and demographic changes taking place in Greene County during the late 19th century. As Flanders and Morrow observed, between 1865 and 1900, Springfield and Greene County changed from a rural-village society into one that boasted a city and country side replete with modern conveniences and complexities." While a variety of geographic, social, and economic factors contributed to the change, three developments were critical in promoting an expansion of the county's road and bridge building program.

Most critical was the establishment of a regional network of railroads. The main line of the St. Louis and San Francisco Railroad reached Springfield by 1871 and subsequently was extended westward into Indian territory. Between 1871 and 1878, the Springfield and Western Railroad was built to Ash grove, thus expanding service to the western part of the county. By 1886, the line to Ash Grove had been incorporated into the Kansas City, Fort Scott, and Memphis system, connecting the area to Kansas City as well as markets in the southeastern United States. The early 1880s saw the construction of two additional parallel lines in northwestern Greene County. The Kansas city, Clinton, and Springfield Railroad terminated at Ash Grove; whereas the Springfield and Northern Railroad provided service to Walnut Grove. Within a 16-year period, northwestern Greene County was linked to national markets as well as regional trade within southwestern Missouri and adjoining States.<sup>3</sup>

This brought an influx of agriculturalists, merchants, and professional people, who increased Greene County's population from 21,549 in 1870 to 52,713 in 1900. Springfield, the county seat, absorbed much of the new population and secured its role as the regional urban market and manufacturing center.<sup>4</sup> However, the northwestern part of the county with available rail service also changed demographically. In 1870, Boone Township contained 1,692 residents. By 1900, the combined population for Boone and Walnut Grove townships (created out of Boone Township in 1871) had grown to 4,307 residents.<sup>5</sup> The hamlets of Ash Grove and Walnut Grove were transformed into a small city and town, respectively, while a third town, Phoenix (Phenix), emerged in the late 1890s.<sup>6</sup>

During the 1880s, important quarry and lime industries were established in northwestern Greene County. These produced limestone block and lime for regional and interstate construction projects well into the twentieth century. The Ash Grove White Lime Association's quarry and lime kiln lay immediately west of Ash Grove. A primary employer for Ash Grove residents, the company also provided income for area farmers who cut thousands of cords of wood each winter for the kiln. The Phoenix

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Quarries, located north of Ash Grove on the Kansas City, Clinton, and Springfield Railroad line, apparently were opened in 1881, while a lime kiln was constructed in the vicinity around 1888.8

Between 1870 and 1900, the economic orientation of the rural parts of Greene County shifted from subsistence to commercial farming with production geared toward supplying regional and national markets. By 1880, Greene County cattlemen were providing breeding stock for the region. Wheat and corn production were important concerns and spurred the establishment of major milling businesses, which by 1904 were producing for national and international markets. In addition, agricultural specialization occurred with the development of truck gardening, commercial dairies and orchards. 9

The impact of these developments in northwest Greene County was most clearly seen in the establishment of related businesses in Ash Grove. 10 The 1880s saw the construction of stockyards and loading docks adjacent to the railroad. A large flour mill was constructed in 1883, followed by a tomato factory, dried apple plant, and wheat elevator in the 1890s. The Ash Grove Creamery was established in 1899. In 1900, the Strawberry Association was formed to promote local production of this crop.

An expanded and improved system of local public roads was vital to economic growth of the county, facilitating settlement and trade in local commercial centers and decreasing the time and cost of hauling to manufacturing centers and shipping points. Il Greene county apparently recognized this. Much of the work of the Green County Court was directed toward the designation of county roads, bridge construction, and maintenance of the system. Il Moreover, the county had the economic means to do this. For example, during the years of 1895 and 1896, the county erected over eight bridges, expending in excess of \$7,900 on their construction. Il This stands in marked contrast to contemporary bridge construction programs undertaken by other counties in southern Missouri. Id

## A. Construction Chronology

On June 6, 1895, E. E. Colby, county surveyor and ex officio road and bridge commissioner, and the county court went to locate a site for the proposed bridge over Clear Creek on the Ash Grove to Walnut Grove road. 15 A month later, on July 12, 1895, Colby presented a report on the bids for construction of the bridge. The \$1,250 contract was awarded to the lowest bidder, J. W. Hoover, General Agent for the Wrought Iron Bridge Company of Canton, Ohio, and called for construction of an iron superstructure and a substructure consisting of iron tubes. 16

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At the time, Colby recommended that the court compare the cost of masonry abutments for the bridge with that of the iron tubes. The recommendation was based on the location and conditions of the bridge site as well as an estimated cost difference of \$250.17 The contract which the court approved on the following day, July 13, 1895, called for a bridge built on iron piers with a 100-foot span and 14-foot roadway. 18

On August 11, 1895, the agents of the Wrought Iron Bridge Company filed their bonds for construction, completion, and maintenance of three bridges in Greene County. These included bonds of \$5,000 for a bridge over the Sac River (at Hackney Mill in Robberson Township) and \$2,500 for a bridge over Clear Creek near Ash Grove. All of the bonds were approved and accepted by the court. 19

There is an unexplained discrepancy in the court records regarding the cost of the Clear Creek Bridge. The records indicate that the approved cost of the contract was \$1,200, \$50 less than the original bid made by the Wrought Iron Bridge Company. However, the bond for the bridge was \$2,500 (twice the original amount bid by the Wrought Iron Bridge Company rather than the contracted cost). Subsequent payments to the Wrought Iron Bridge Company suggest that the actual price was \$1,250, not \$1,200. 21 Possibly, the discrepancies relates to the bridge commissioner's recommendations regarding the bridge substructure and reflects the results of negotiations regarding the type and cost of supports for the bridge.

Reports of the bridge commissioner generally do not document the construction of the Clear Creek Bridge in the court records. However, payments for materials and labor provide indirect evidence of the project's progress. Apparently, fabrication of the bridge was completed by the fall of 1895, for J. W. Hoover submitted a bill for partial payment for the Clear Creek and Hackney bridge superstructures on November 25, 1895. The court allowed payment and a warrant was ordered on the bridge fund for the amount of \$2,000. On the same day, the court ordered the bridge commissioner to advertise and let contracts for construction of the approaches to these two bridges. <sup>22</sup>

The Clear Creek Bridge (super- and substructures) was erected during the winter of 1895-1896, as suggested by payments for the work. On January 9, 1896, the court approved payment of \$90 to E. E. Colby for the iron tubes used in the substructure, 23 while on January 14, 1896, the court allowed payment of \$1,250 to J. W. Hoover for the bridge over Clear Creek. 24

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At the same time, arrangements for construction of the approaches was progressing. During the January 13, 1896, court session, the bridge commissioner submitted plans for the approaches to the bridge, which were accepted and approved by the court, and filed a report on the letting of the approaches. Three separate contracts were let to the lowest bidders: one for trestls approaches was awarded to W. A. Post of Kansas City for \$167, one for "the earth approaches about 80 feet in length" was awarded to T. B. Hollis at "8/2 cents psr cubic yard," and the third for masonry riprap was also awarded to T. B. Hollis at 4 9/2 cents per square yard, 9 square feet superficial measurement." The court examined and approved the report and ordered the road commissioner to enter into contract with these parties. 25

There was a cost overrun in the construction of the Clear Creek and Hackney bridges. This was explained in a February 3, 1896, report by Colby, the bridge commissioner, to the court. Longer iron tubes were needed in the substructures of both bridges, and there was an additional charge for labor and material used in the west foundation of the Clear Creek Bridge. The Wrought Iron Bridge Company had agreed to furnish the 22 feet of extra tubes at a cost of \$330. The charge for labor and material was \$65. The court authorized payment of \$805 to J. W. Hoover for the balance due on the construction of the Hackney Bridge and for the work on the Clear Creek Bridge. 26

Work on the approaches to the Clear Creek Bridge began in the spring of 1896. A warrant issue of \$31 was presented to G. B. Hollis for work on the earthen approaches on April 3, 1896, while on April 6, Hollis received another warrant issue of \$19 in partial payment for the riprap. <sup>27</sup> The lumber for the trestle approaches arrived in late spring, and the court authorized payment of \$14 to the Kansas City, Fort Scott and Memphis Railroad for shipping charges. <sup>28</sup>

The court approved warrant issues of \$35.33 on June 6, 1896, and \$22 on June 25, 1896, to T. B. Hollis for work on the masonry abutments for the wooden approach spans. 29 On June 25, 1896, E. E. Colby filed a report on the final estimate of the embankment and riprap at the Clear Creek Bridge and on the balance of \$22 due T. B. Hollis, the contractor. The court approved the report. 30 The court records contain no subsequent references to the construction of the Clear Creek Bridge approaches, so it is assumed that work was completed by the summer of 1896.31

The Clear Creek Bridge was repaired in 1904. On February 17 of that year, the court authorized the road commissioner, E. J. Rhodes, to enter into a contract with the Canton Bridge Company of Canton, Ohio, for repair and construction of four bridges.<sup>32</sup> Those executing the

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contract on February 17, 1904, included J. W. Hoover, "Genl. Agent," and Ed W. Appleby, "Cont. Agent" of the Canton Bridge Company and for the court, B. J. Diemer, presiding judge, and E. J. Rhodes, ex officio road and bridge commissioner. 33 The court approved the \$1,100 contract on February 22, 1904.34

The contract was included in the court record, but the plans for construction and repeir were not. Thus, the nature of repairs must be inferred wholly from the contract. The contract specified that the Canton Bridge Company would provide all materials, except lumber, needed for construction and repair. These would include a 108-foot by 14-foot span and five 16-foot approach spans for the Clear Creek Bridge. In effect, repairs to the Clear Creek Bridge entailed replacing the floor of the original superstructure as well as the wooden approach spans. It is likely that the deck was also replaced at this time. The repairs were scheduled for the spring of 1904, with the county completing preparatory work on the four substructures by May 1. Fabrication of the spans was to be completed by June 1, with the Canton Bridge Company performing the repairs following delivery of the parts. 35

Payment for the lumber used in repairing the bridge indicate that the project apparently proceeded on schedule. On April 28, 1904, the court approved payment to John Taylor of \$50 for lumber for the Clear Creek Bridge and a second bridge. 36 On June 14, 1904, T. K. Bowman was paid \$3.60 for measuring the lumber and hauling it to the two bridge sites. 37 According to contract specifications, the Canton Bridge Company would be paid in full upon completion of repairs. On July 12, 1904, the court authorized payment of \$1,100 to the company for the balance due on repairing four bridges, 38 indicating that the work on the Clear Creek Bridge had been completed by the summer of 1904. Court records for subsequent years do not document specific repairs or elterations of the Clear Creek Bridge.

#### B. Location

Court records place the bridge es spenning Clear Creek on the Ash Grove to Walnut Grove public road in Boone Township. 39 Ash Grove and Walnut Grove began in the 1850s es small hamlete, consisting, in the case of Ash Grove, of a blacksmith shop and general store. Railroad construction and the flood of immigrants, following the Civil War, brought growth to northwestern Greene County. Plats for both communities were filed in the early 1870s. Both became shipping points and trade centers. 40 Ash Grove prospered. By the early 20th century, it was a smell city, the second most populous town in Greene County, with numerous retail and commercial operations,

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hotels, rsstaurants, two newspapers, an opera house and a college.<sup>41</sup> In the late 1890s, the Phenix Stone and Lime Company established a town at their quarries in Section 35, Township 31 North, Range 24 Wsst. Ash Grove and Walnut Grove competed for the trade of Phoenix residents.<sup>42</sup> Maintenance of the public roads connecting Phoenix to the two towns became a concern<sup>43</sup> and probably served as an incentive for the 1904 repairs to the bridge.

An 1876 atlas shows a road extending from Walnut Grove in a southwesterly direction and intersecting an east-west road as well as the railroad just west of Ash Grove in Section 19. The road from Walnut Grove crossed Clear Creek in Section 4, but the ford lay to the east of the present site of the Clear Creek Bridge. 44 By 1886, the road was relocated, providing a direct route into Ash Grove. 45 Again, the road appears to cross Clear Creek to the east of the present bridge sits.

The 1904 Greene County Atlas shows the Ash Grove to Walnut Grove road crossing Clear Creek at the present bridge site. 46 The road alignment probably corresponds most closely with the one followsd in 1896. Phoenix appears in this atlas. The public road to Phoenix intersected the Ash Grove-Walnut Grove road north of the Clear Creek Bridge in Section 33.47 In effect, the bridge was located on the primary route used for travsl between the three communities of Ash Grove, Walnut Grove, and Phoenix.

The Missouri State Highway Department constructed Route V in 1935. The road followed the alignment of the Ash Grovs to Walnut Grove road from the northern city limit of Ash Grove up to the present intersection with Farm Road 33. At that point, a new right-of-way was sstablished that bypassed the Clear Creek Bridge. 48

### II. THE BRIDGE

### A. Description

The Clear Creek Bridge is a six-span structure with two approach spans on the south and three on the north. The main structure is a six-panel pin connected Pratt through truss, which is 99 feet in length, 12.8 feet wids (curb to curb), and 14.3 feet high (vertical clearance over deck). Compression members in the truss include the top chords, end posts and verticals, except for the hip vertical (hangers) adjacent to the inclined and posts.

Tension members include the hangers, diagonals, counters and lower chords. The end posts and top chords are made of laced channel steel with a steel plate riveted to the upper side. The verticals are made of two channels laced on both sides. The hangers are

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square bars. The diagonals consist of two square or two rectangular bars. The counters are round bars with turnbuckles to permit adjustment. The lower chords are double rectangular eyebars and are pin connected to the lower end of the verticals. The floor beams are steel I-beams connected to the pina with U-bolts. The floor stringers consist of channels on the outside and five I-beams on the interior. The top and bottom laterals are round bara. The top lateral strut consist of two channels riveted back to back. The portals are constructed of angle irons riveted back to back, with the exception of the inclined member, which runs from the center of the knee brace to the top chord. That member is a single angle iron.

The Pratt through truss is supported at each end by two riveted steel tubes, which are filled with concrets or gravel. The tubs are connected by diagonal braces, which are made of round bars with turnbuckles. The approach spans consist of a timber deck on steel stringers identical to those on the truss. The north and south ends of the bridge appear to be supported on dirt. The intermediate piers on the south approach spans consists of three steel piles with a horizontal beam on top. The intermediate abutments on the north approach spans are concrete.

The bridge has a timber deck. The timbers transverse to the centerline, supported by the steel stringers, are 3 inches thick and vary in width from 6 inches to 12 inches. There is a running board for each wheel track made of three 2-inch by 12-inch planks. There id a 3-inch by 6-inch timber curb along each side of the structure for its entire length. There is a hand rail made of angle iron on each side of the bridge throughout its entire length. The bridge has been painted in the past, but is preaently in bade shape. The structure is posted for a three-ton load limit.

### B. Modifications

The 1904 repairs to the Clear Creek Bridge apparently resulted in replacement of the floor of the superstructure, as well as the original wooden trestle approaches. Although early court records do not document specific repairs, it appears that the bridge dsck has been replaced periodically and the metal truss repainted. The deck was rehabilitated in 1981.

## C. Ownership and Future

The Clear Creek Bridge has been owned and maintained by Greene County since 1895. Presently, it is located on Farm Road 33, a county highway. The Missouri Department of Highways and Transportation

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county bridge inventory number 692. The bridge has been registsred as a historic archaeological site with the Archaeological Survey of Missouri and is designated as 23GR598. Although not officially designated as such, the bridge is locally known as the "Baker-Hawkins" bridge because of its proximity to farms hald since ca. 1905 by the Baker and Hawkins families. 49

An appraisal of the Clear Creek Bridge revsaled that it is structurally insufficient and functionally obsolete. Structural problems include the following: rusting of the iron truss, a bent steel pile in need of lateral bracing, split I beams, and one masonry abutment out of plumb. In addition, the bridge has been vandalized. This activity resulted in the removal and breakage of the bridge plate from the north portal in 1985. 50 Because of its condition, a decision was made to replace the bridge.

At present, the Greene County Highway Department is negotiating with several partiss interested in using the bridge. As the proposed bridge replacement project progresses, the metal truss will be matchmarked, disassembled, removed, and stored until such a party is identified.

# III. BIOGRAPHICAL MATERIAL

# A. The Wrought Iron Bridge Company

Located in Canton, Ohio, the Wrought Iron Bridge Company was in operation between 1864 and 1900.51 The company sold its products through a network of agents, located throughout the continental United States and became one of the leading bridge building firms in the United States.52 During the years of 1895 and 1896, the company fabricated all of the metal bridges erected on Greene County public roads.53

#### B. The Canton Bridge Company

The Canton Bridge Company was located in Canton, Ohio. Dates regarding the organization and duration of the business suggest that it operation from 1876 to 1925, when it was bought by the Massillon Steel Joist Company. Hike the Wrought Iron Bridge Company, it had a nationwide business but apparently focused on the region encompassed by the present states of Oklahoma, Nebraska, and Kansas. Between 1903 and 1905, the Canton Bridge Company maintained a virtual monopoly over bridge work on public roads in Greene County, for the 24 construction and rspair projects approved by the court during that period were all undertaken by the Canton Bridge Company. So

# IV. FOOTNOTES

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- 22 Ibid., pp. 415-416.
- 23 Ibid., p. 476.
- 24 Ibid., p. 530.
- 25 Ibid., p. 500.
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- 29 Ibid., pp. 22, 246.
- 30 Ibid., p. 247.
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